

**REMARKS:**

This application has been carefully reviewed in light of the Office Action dated April 21, 2006. Claim 7 remains in the application, with Claims 8 to 12 having been cancelled herein without prejudice or disclaimer of the subject matter thereof. Claim 7 has been amended herein and is the sole independent claim currently under consideration. Reconsideration and further examination are respectfully requested.

Initially, Applicant thanks the Examiner for the courtesies extended to Applicant's undersigned representative during the telephonic interview conducted on July 7, 2006. During the interview, the subject matter of amended independent Claim 7 was discussed in light of the 35 U.S.C. § 103(a) rejections entered in the Office Action. After discussing the references applied in the rejections and reviewing the independent Claims, no agreement was reached at the conclusion of the interview.

Applicant notes that receipt of the Substitute Specification (both clean and marked-up versions) identified in the Preliminary Amendment of May 17, 2005 was acknowledged by the USPTO, as is evidenced by the attached postcard receipt bearing a U.S. Patent and Trademark Office mailroom stamp of the same date. Applicant has attached hereto replacement copies of both the clean and marked-up versions of the Substitute Specification originally submitted May 17, 2005.

The Specification has been amended herein to correct minor errors in translation. No new matter is believed to have been added with these amendments.

The amendment of Claim 7 is not believed to introduce any new matter. Support for amended Claim 7 can be found throughout the specification, particularly in paragraph [0083], original Claim 9 and Figure 4.

Claim 9 was rejected under 35 U.S.C. § 112, second paragraph, for allegedly being indefinite. Without conceding the correctness of this rejection, Applicant has cancelled Claim 9 without prejudice or disclaimer of the subject matter therein, as indicated above. Accordingly, the rejection now being moot, reconsideration and withdrawal thereof are respectfully requested.

Claims 7 and 8 were rejected under 35 U.S.C. § 103(a) over Japanese Patent Application No. JP 48-49,211 (“JP ’211”); and Claims 7 to 12 were rejected under 35 U.S.C. § 103(a) over U.S. Patent No. 6,923,244 (“Motegi”) in view of JP ’211.

The present invention concerns an injection apparatus in a cold chamber die casting molding machine. With reference to particular claim language, amended independent Claim 7 is directed to an injection apparatus in a cold chamber die casting molding machine configured to supply molten metal of a light metal material into a material supply mouth of an injection sleeve having a plunger injection device configured to inject the molten metal using an inserting plunger. The injection apparatus includes a melting device configured to melt the light metal material. The melting device includes (i) a billet supplying device configured to replenish the molten metal using a plurality of cylindrical rod-shaped billets of the light metal material and (ii) a billet inserting device disposed adjacent to the billet supplying device. The billet inserting device is configured to move each billet forward with the inserting plunger and/or to retreat the inserting plunger a distance which exceeds an overall length of each billet. The melting device further includes (iii) a melting cylinder situated adjacent to the billet supplying device obverse to

the billet inserting device. The melting cylinder includes a cylinder bore having an inside diameter which does not allow most of the cylinder bore to come into contact with a front end of each billet. The melting cylinder is configured to accommodate the plurality of billets moved forward by the inserting plunger and to melt each billet from the front end of said billet to produce several shots of molten metal. The melting device further includes (iv) a cooling member disposed between the billet supplying device and the melting cylinder. The cooling member has a through hole and a cooling duct. The cooling duct is configured to circulate cooling liquid around the through hole. The cooling member is configured to cool the billets. The melting device further includes (v) a cooling sleeve disposed between the cooling member and the melting cylinder. The cooling sleeve has an annular groove with a diameter larger than a diameter of the through hole. The annular groove is configured to cool the molten metal and to form an annular seal of solidified molten material on a periphery of the billets. The injection apparatus further includes a molten metal feeding member configured to pour molten metal from the melting device to the plunger injection device. The molten metal feeding member includes a material supplying hole configured to pour the molten metal from a distal end of the cylinder bore of the melting cylinder to the material supply mouth. The melting device is configured to meter the molten metal by pushing each billet with the inserting plunger and supplying one shot of the molten metal into the injection sleeve after the plunger injection device makes the inserting plunger retreat for replenishing.

The applied references are not seen to disclose or suggest the features of the present invention, particularly with respect to at least the features of (1) a cooling member disposed between the billet supplying device and the melting cylinder, the cooling member having a

through hole and a cooling duct, the cooling duct configured to circulate cooling liquid around the through hole, the cooling member configured to cool the billets, or (2) a cooling sleeve disposed between the cooling member and the melting cylinder, the cooling sleeve having an annular groove with a diameter larger than a diameter of the through hole, the annular groove configured to cool the molten metal and to form an annular seal of solidified molten material on a periphery of the billets.

JP '211 is seen to be generally directed to rapid melting equipment in an injection molding machine. As indicated in the Office Action, JP '211 does not show a billet supplying device. Moreover, nowhere is JP '211 seen to disclose or suggest either (1) a cooling member disposed between the billet supplying device and the melting cylinder, the cooling member having a through hole and a cooling duct, the cooling duct configured to circulate cooling liquid around the through hole, the cooling member configured to cool the billets, or (2) a cooling sleeve disposed between the cooling member and the melting cylinder, the cooling sleeve having an annular groove with a diameter larger than a diameter of the through hole, the annular groove configured to cool the molten metal and to form an annular seal of solidified molten material on a periphery of the billets.

Motegi is not seen to correct the foregoing deficiencies of JP '211. Motegi is seen to be generally directed to a pouring apparatus for castings. In particular, Motegi is directed to a pouring apparatus including a solid material supply means 13 connected to a melting basin 11. *See* Motegi, col. 2, ll. 54-55; Figure 1. Between the solid material supply means 13 and melting basin 11 is a shield block 22, formed of “ceramics or the like.” *See* Motegi, col. 2, ll. 54-56. Disposed through shield block 22 is a transit port 22a with “a diameter that is approximately the

same as the outside diameter of the solid material 12.” *See* Motegi, col. 2, ll. 55-57. The diameter of transit port 22a is uniform, and no annular groove with a diameter larger than the diameter of the transit port 22a is disclosed or suggested. *See* Motegi, Figure 2. As can be seen with further reference to Figure 2, the shield block 22 of Motegi is monolithic in construction and does not include a cooling duct configured to circulate cooling liquid around the through hole.

The Office Action alleged that Motegi teaches “a concept of cooling the molten metal at the periphery of the billet to form a seal for preventing the molten metal from flowing backward.” Applicant respectfully disagrees with this interpretation of Motegi. Indeed, not only does Motegi fail to disclose or suggest that the molten metal should be cooled, but the only instance of the word “cooling” that appears in Motegi occurs in a context which teaches away from cooling the liquid metal: “[t]he repeated discharge and suction of the semi-melt in the discharge nozzle 16 *prevents* cooling of the semi-melt.” *See* Motegi, col. 4, ll. 7-9 (emphasis added).

Furthermore, Applicant respectfully disagrees with the assertion in the Office Action that it would have accordingly been obvious “to provide *any* design to form a seal between the billet and the cylinder as long as it will fulfill the sealing function” (emphasis added). To establish *prima facie* obviousness of a claimed invention, all the claim limitations must be taught or suggested by the prior art. *See In re Royka*, 490 F.2d 981 (CCPA 1974) (“All words in a claim must be considered in judging the patentability of that claim against the prior art”); *see also* M.P.E.P. § 2143.03. Even were Motegi to teach the concept of cooling the molten metal (which it does not), such a hypothetical teaching would not render obvious the specific structural

limitations of the cooling member, through hole, cooling duct, cooling sleeve, annular groove and annular seal of solidified molten material as recited in amended independent Claim 7.

Accordingly, Motegi is not seen to disclose, teach or suggest the features of amended independent Claim 7 of the present invention, at least with respect to the features of either (1) a cooling member disposed between the billet supplying device and the melting cylinder, the cooling member having a through hole and a cooling duct, the cooling duct configured to circulate cooling liquid around the through hole, the cooling member configured to cool the billets, or (2) a cooling sleeve disposed between the cooling member and the melting cylinder, the cooling sleeve having an annular groove with a diameter larger than a diameter of the through hole, the annular groove configured to cool the molten metal and to form an annular seal of solidified molten material on a periphery of the billets.

Claims 7 to 12 were provisionally rejected on the ground of nonstatutory obviousness-type double patenting over claims 14 to 16 of co-pending U.S. Patent Application No. 10/947,263, which issued as United States Patent No. 7,066,236 on June 27, 2006. Accordingly, to expedite the prosecution of the present application, Applicant has submitted herewith a Terminal Disclaimer To Obviate A Double Patenting Rejection Over "Prior" Patent. Reconsideration and withdrawal of these provisional double patenting rejections are respectfully requested.

In view of the foregoing amendments and remarks, the entire application is believed to be in condition for allowance and such action is respectfully requested at the Examiner's earliest convenience.

**Application No.: 10/535,478**

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Respectfully submitted,

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